

HARD CHOICES

A Report on the Increasing Gap Between America's
Infrastructure Needs and Our Ability To Pay
for Them

Appendix 12. MONTANA

A CASE STUDY

PREPARED FOR THE USE OF THE
SUBCOMMITTEE ON ECONOMIC GOALS AND
INTERGOVERNMENTAL POLICY
OF THE
JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES



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Preface

Infrastructure problems are widespread. They do not respect regional or state boundaries. To secure a better data base concerning national and state infrastructure conditions and to develop threshold estimates of national and state infrastructure conditions, the Joint Economic Committee of the Congress requested that the University of Colorado's Graduate School of Public Affairs direct a twenty-three state infrastructure study. Simultaneously, the JEC appointed a National Infrastructure Advisory Committee to monitor study progress, review study findings and help develop policy recommendations to the Congress.

In almost all cases, the studies were prepared by principal analysts from a university or college within the state, following a design developed by the University of Colorado. Close collaboration was required and was received from the Governor's staff and relevant state agencies.

Because of fiscal constraints each participating university or college agreed to forego normal overhead and each researcher agreed to contribute considerable time to the analysis. Both are to be commended for their commitment to a unique and important national effort for the Congress of the United States.

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MONTANA CASE STUDY

I. Introduction

Purpose and Scope of Study

The purpose of this study is to estimate Montana's public investment needs and revenues for transportation; water supply storage, treatment, and distribution; sewage treatment; and hazardous waste disposal for the period 1983-2000. To the extent permitted by the data, needs and revenues are estimated separately for the periods 1983-1987 and 1988-2000.

The study also explores policy issues and methodological problems relevant to an understanding of Montana's basic infrastructure needs. Qualitative assessments of needs and revenues by Montana officials are used to augment and qualify numerical estimates, especially where there is significant sensitivity of the estimates to future institutional and economic conditions and constraints.

Data and information used in the study are limited to that obtained from published reports and interviews with Montana officials. Although infrastructure needs and revenues at the local level are included where data are available, the emphasis of the study is at the state level. We wish to thank Governor Schwinden and his staff for their assistance in the initial threshold effort at compiling aggregate basic infrastructure needs.

Population

Montana is a large and sparsely populated state. It ranks 4th among all states in area (147,138 square miles) and 43rd in population.¹ According to the U.S. Bureau of the Census, Montana's population in 1980 was 786,700. Between 1970 and 1980, Montana's population increased 11.6 percent compared to the national increase of 8.3 percent. The population growth of the past decade was 40 percent greater than that of the nation but 40 percent less than that of the Rocky Mountain region as a whole.² That is, although Montana grew faster than the nation, its growth rate was less than other states in a rapidly growing region. For example, between 1970 and 1980 Colorado's population grew 27%.³

Montana's growth has not only been slower than Colorado's but also it has been less sustained. Between 1950 and 1960, Montana's population growth rate was 14 percent, but between 1960 and 1970 it was only 2.6 percent. In comparison, the nation's population grew by 13 percent and Colorado's grew by 28 percent between 1960 and 1970. The 1960-1970 decade was a period of economic stagnation overall. About 58,000 Montanans, two-thirds of them under 30 years old, left the state to seek economic opportunities elsewhere. This net out-migration was reversed during the 1970's.⁴

¹Webster's Atlas, Springfield, MD: G & C Merriam Co., 1973, p. 320.

²Governor's Office of Commerce and Small Business Development, Economic Conditions in Montana: Report of the Governor 1980, pp. 19-20. Hereafter referred to as Economic Conditions.

³Colorado: Investing in the Future, Denver, CO: Governor's Blue Ribbon Panel, July 1981.

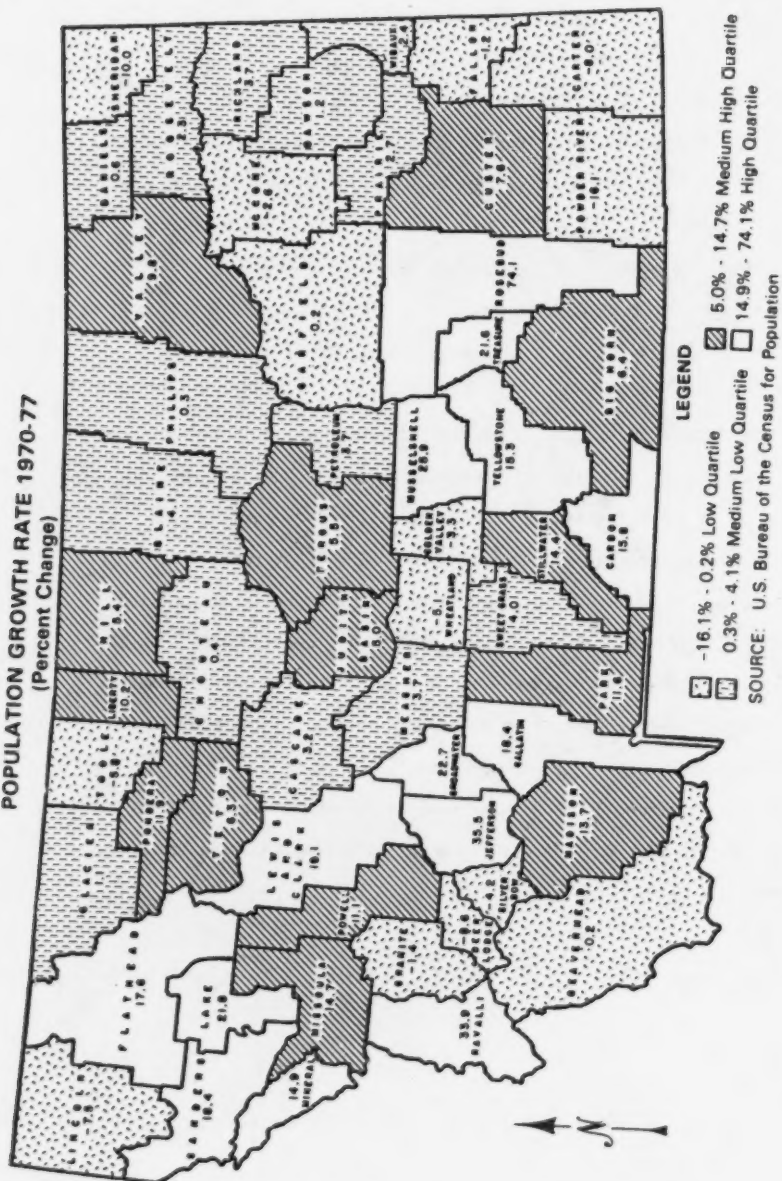
⁴Economic Conditions, p. 20.

Population growth has also been limited to a few areas within the State. For example, over two-thirds of the growth has occurred in five counties: Flathead (Kalispell), Gallatin (Bozeman), Lewis and Clark (Helena), Missoula (Missoula), and Yellowstone (Billings). Population loss continues to be a problem in the cities of Great Falls, Anaconda, Butte, and many rural areas.¹ Of Montana's 56 counties, about 27 either lost population or remained at essentially the same population between 1970 and 1980, even as the State's population grew significantly.² As an illustration, the comparative growth rates of Montana counties between 1970 and 1977 is shown in Figure 1.

The geographic distribution of population growth in Montana shows that an aggregate statewide growth rate of 13 percent disguises many problems of uneven growth. Most of the high growth counties are concentrated in and along the Rocky Mountains, much as they are in Colorado. Counties in the eastern plains generally showed population loss or very little growth, except those counties where extensive coal mining took place. The county which grew most rapidly between 1970 and 1980 was Rosebud where the Colstrip power plant is located. The second-fastest growing county was Ravalli in the mountainous western edge of the State. Western Montana also contains a pocket of counties, centered around Butte and Anaconda, that have experienced high unemployment and population loss with the closing of the Anaconda copper mines, smelter and refinery.

¹Economic Conditions, p. 19.

²Phillip D. Brooks, "Revised Population Projections," unpublished memorandum, September 1981.

POPULATION GROWTH RATE 1970-77
(Percent Change)

Source: Economic Conditions

There are several consequences of population growth patterns in Montana for infrastructure planning and budgeting. Existence of disparate centers of high population growth and loss occurring simultaneously makes it difficult to develop a coherent statewide capital investment strategy. There will be opposite pulls on investment planning -- one to accommodate growth-induced needs and the other to induce growth through public investment. This pull might intensify the east-west division that seems to characterize Montana's politics as well as physiography.

Economy

Population gains and losses are, of course, closely linked to economic growth and decline. Montana Territory was created in 1864 after the discovery of gold attracted a rush of miners and other fortune seekers.¹ Silver and copper were subsequently mined, and the timber products and agriculture industries were developed to provide for the needs created by mining, railroad construction, and military activity. By the time Montana became a state in 1889, it was known as a major exporter of raw materials and products.

Montana's economic role continues to be a specialized and limited one of providing raw materials for the national marketplace. It is rich in natural resources, sparsely populated, and relatively far from major U.S. population centers. Resource extraction rather than manufacturing of goods for final consumption characterizes Montana's economy. Mining, wood products, and agriculture have provided the foundation for Montana's economic development and will continue to do so even though nearly all of the recent growth in employment has been in the service and trade sectors.

¹This and the following paragraphs are based on Economic Conditions, pp. 11-12.

The structure of Montana's economy has several important consequences for infrastructure planning and budgeting. First, resource extraction is very susceptible to boom-bust cycles, and it is very easy to underbuild or overbuild public facilities and services whenever growth and decline can be equally rapid. If an economy is heavily dependent on resource extraction, it will mean that growth and infrastructure investments will be determined by historical, or even paleontological, accident. It will mean investments in remote, sparsely populated communities in the State that will have difficulty coping with demographic and economic fluctuations.

Second, resource extraction for exports will place major burdens on the state's transportation facilities because minerals, energy fuels, lumber, and grains require transportation in bulk from dispersed parts of the state. Excessive transportation costs or delays will place the state's mining, timber, and agricultural industries at a competitive disadvantage. And, the heavy loads involved lead to rapid deterioration of highways, bridges, and railroad crossings. This means that the state will incur relatively high costs to maintain, repair, and upgrade transportation facilities, often in remote parts of the state.

Third, cyclical fluctuations and boom-bust cycles will place extraordinary demands not only on the state's capital resources but also on its institutional capacity to invest scarce capital resources in a cost-effective and equitable manner. The state will need to internally coordinate its technical and financial assistance programs and develop closer relationships with local government.

Infrastructure planning and budgeting present problems in themselves, such as issues related to the relevance of technical performance standards used to assess present conditions, the adequacy of present service levels, and the cost-effectiveness of investments to meet future needs. There is also the problem of coordinating infrastructure investments with future economic development and population growth. Should a state plan and make infrastructure investments to direct and manage growth, or should it try to respond as quickly as possible to growth needs as soon as they become evident? How can a state plan and make infrastructure investments in a way that will meet the best interest of the state as a whole? The resolution of the last question obviously depends on the kind of future than Montanans are willing and able to invest in, but there are also more mundane analytical problems concerning the relationships of infrastructure investments to adequacy of service and quality of life. Not the least of these analytical problems is the specification of the type and level of future population and economic development that will likely take place under alternative assumptions on national markets and other factors which shape the State's growth scenario.

Population and Economic Projections

Population projections for Montana counties were prepared by the Census and Economic Information Center of the Department of Administration initially in 1978. These estimates were then revised in September 1981 to reflect the 1980 Census and economic developments expected to affect future

population.¹ The county projections were made by using a total state population projection of 935,600 in the year 2000 as a control. The control population was approved by the U.S. Environmental Protection Agency as part of the statewide Water Quality Management Planning Project. The statewide population projection for 1990 was 859,900. The projected overall growth rates were 9.3% for 1980-1990, 8.8% for 1990-2000, and 18.9% for 1980-2000.

The county population projections made by the Center anticipate that the pattern of growth and decline of the 1970-1980 period will continue through the year 2000. That is, growth will be uneven and concentrated to a limited number of counties (see previous section). The rapid growth experienced by these counties between 1970 and 1980 is not expected to continue. For example, the growth rate in Rosebud County which was 55% between 1970 and 1980 is expected to diminish to 28% between 1980 and 1990 and to 4% between 1990 and 2000. In the western part of the State, the growth in Missoula County is expected to diminish from its 30.5% rate between 1970 and 1980 to 11.5% between 1980 and 1990 and 14.3% between 1990 and 2000. But, both of these counties are expected to grow at rates well above that of the state as a whole during the next two decades.

The major consequence of the population projections for infrastructure investment planning is that no major changes in growth patterns are expected to occur during the next 20 years. Areas now growing will continue to grow,

¹This and the following paragraph based on "Revised County Population Projections," September, 1981.

and those declining will continue to decline. Through infrastructure planning and investing, Montana can either accommodate this pattern of growth or it can attempt to encourage a pattern of growth that is more balanced.

The projections prepared by the Center are not official nor are they sanctioned by state statute. The projections do, however, provide a basis for statewide planning of infrastructure since they are used by the water quality bureau of the Department of Health and Environmental Sciences in the evaluation of design capacity for wastewater treatment systems¹ and by the Aeronautics Division of the Department of Commerce to prepare the Montana State Airport System Plan Update. Agencies responsible for the other areas of infrastructure included in this case study (highways, railroads, mass transit, drinking water facilities, and hazardous waste disposal) do not make explicit use of these projections.

The county population projections were based on an economic-demographic model which assumes that changes in employment accounts for most population migration. For any given county, employment was projected for industries that sell products outside of the county. These industries were labelled as "basic" industries. Employment for sectors that serve the county population ("non-basic" industries) was projected by using a constant ratio of basic to non-basic employment. Population was projected by using a population to total employment (basic plus non-basic) ratio.²

¹Interview with Bureau staff, November 1982.

²"Revised County Population Projections," September 1981.

Population growth due primarily to migration patterns will determine one component of infrastructure need. This "growth component" will be determined primarily by future trends in Montana's basic industries: agriculture, wood products, and mining. The other component can be characterized as upgrading facilities to meet the needs of the existing population. This component will be discussed later under each of the infrastructure categories.

Agriculture continues to be the most dominant economic sector in Montana, even though its share of the employed labor force has fallen from a high of 38% in 1920 to slightly over 9% in 1980.¹ Agricultural output is extremely sensitive to variations in climate and prices, and output trends are difficult to interpret. The State's three major agricultural products are wheat, cattle, and barley. Although marked by yearly fluctuations, output of all three has increased significantly since 1960. In 1979, Montana produced over 2.6 million head of cattle, 116 million bushels of wheat and 1 million bushels of barley. Over 6 million acres of land were harvested for grain.

The relatively positive outlook for Montana's agricultural sector also depends greatly on its ability to retain its competitive strength relative to other agricultural areas. Investments in infrastructure, especially transportation, will be necessary for Montana to maintain competitiveness with other states and countries in cattle and grain production. These investments will be discussed later.

¹This and the following paragraphs are based on Economic Conditions.

The wood products industry is also vulnerable to "external" economic factors, particularly cycles in housing construction. In 1979, a banner year, the industry employed nearly 11,000 people in Montana. During the recent national recession, housing construction fell sharply. Although aggregate employment figures for 1982 were not available as this report was in preparation, unemployment is known to be very high in some of Montana's western counties where the wood products industry is centered.

In addition to economic cycles, the other principal determinant of growth in the wood products industry will be Federal land use policies and timber cutting practices. The U.S. Forest Service has acknowledged that land under its management produces 50% less wood per acre than land under private management. Future wilderness designation may also limit cutting on Federal lands. Competition from other lumbering areas of the country will also affect output.

The long-term outlook for the wood products industry in Montana is that the level of harvest will remain essentially constant. National demographic patterns indicate that a high level of new household formation and demand for housing should be maintained during the next decade. Employment gains, however, are expected to continue to be in processed wood materials rather than in logging or milling.

The implications of expected trends in the wood products industry for infrastructure investments are not as clear as they are for agriculture. Transportation facilities will continue to be critical in keeping Montana competitive. Private sector investments in growing and harvesting techniques and equipment, technological innovations in marketing, and Federal policy and management of public lands will play key roles in Montana's wood products industry.

Mining was Montana's first industry and remains an important part of its economy. The Montana State Seal contains the words "oro y plata" (silver and gold) and the pick and shovel of a miner. Precious metal mining now constitutes a very small part of mining activity in the state. Copper has been by far the most important metal and non-fuel mineral mined in Montana. Metal mining is very sensitive to world and national markets, and over 6,000 jobs have been lost in this sector of Montana's economy since 1950. The Butte underground copper mine was closed in 1975 due to depressed prices and international competition. A loss of 1,500 jobs resulted from the shutdown. The closing of the Anaconda smelter and refinery in 1960 was also a severe setback for the State's metal industry and caused the loss of 1,500 jobs.

Copper production declined from 131,000 short tons in 1974, prior to the shutdown of the Butte mine, to 71,000 short tons in 1979. Almost all of the State's copper ore is produced in the Butte area through open pit mining. The Montana Bureau of Mines has identified important copper deposits in Lincoln County and Stillwater County. The short-term outlook for copper production is bleak but increased production is anticipated over the next 10 to 15 years.

Of the energy minerals, coal is the most important in terms of current and future production. Coal production rose from 7.1 million tons in 1971 to 32.5 million tons in 1979. Almost all of the coal is mined in Rosebud and Big Horn counties. Of the 29.6 million tons of coal mined in 1980, 29.4 million tons (or 96.1%) were mined in these two counties.¹ There are extensive deposits of coal underlying a large portion of eastern Montana. More than one quarter of the coal reserve of the United States is located in Montana.² Coal accounts for 64% of the energy produced in Montana, and about 90% of the coal mines is exported to other states.³

Coal production in Montana is expected to continue increasing.⁴ If coal mines that are described by the Department of Natural Resources and Counties as "expected" are built, Montana's 1979 coal output should double by 1990.⁵ Expected new coal mines are those which are extensions of existing mines or those for which a permit application is being prepared. If a major effort to develop synthetic fuel takes place, Montana's coal output could be three times the 1979 level by 1990.⁶ Under this maximum output scenario, Montana would produce about 100 million tons of coal per year by 1990.

¹Montana Aeronautics Division, Montana State Airport System Plan Update, June 1982, pp. 1-31.

²Nancy McLane, Montana Energy Almanac, Helena, MT: Department of Natural Resources and Conservation, October 1980, p. 7.

³Montana Energy Almanac, p. 13.

⁴Economic Conditions, p. 66.

⁵Montana Energy Almanac, p. 19.

⁶Montana Energy Almanac, p. 19.

The implications of a major growth in coal mining for infrastructure investment needs are similar to those discussed earlier for resource extraction in general. As with wood products, the level of future coal production will depend greatly upon market prices and Federal policies. Changes in Federal air quality regulations may also nullify the economic advantage that Montana's low-sulfur coal presently enjoys over Eastern coal which is generally higher in sulfur content. If scrubbers to remove sulfur dioxide from power plant emissions are required by Federal regulations, the cost advantage of transporting low-sulfur Western coal eastward would be nullified. In such a case, increasing concern about acid rain may work to Montana's advantage in environmental quality but to its disadvantage economically.

Montana also has extensive oil and gas deposits. The American Gas Association estimates that there are 140 million barrels of proved crude oil reserves¹ and 992 billion cubic feet of proved natural gas reserves.² Production of crude oil between 1970 and 1980 remained nearly constant at about 30 million barrels per year.³ The largest oil producing counties in 1980 were Fallon, Powder River, Richland, and Sheridan, accounting for about 62% of the total oil produced.⁴ Total natural gas production in 1980 was 54

¹The Montana Oil and Gas Conservation Division estimates proven oil reserves in the State at 236 million barrels (Economic Conditions, p. 30).

²Montana Energy Almanac, p. 7.

³Montana Energy Almanac, p. 6; Montana State Airport System Plan Update, pp. 1-34.

⁴Montana State Airport System Plan Update, pp. 1-33 to 1-34.

billion cubic feet.¹ Almost one-fourth of this production took place in Big Horn County.²

Future development of Montana's oil and natural gas resources will be concentrated in the Williston Basin in the east and the Overthrust Belt in the west.³ About 55% of the State's output of oil in 1979 was produced in the Williston Basin. Exploration and production in the Basin will continue to impact many small communities in eastern Montana. The majority of land in the Overthrust Belt is under the jurisdiction of the U.S. Forest Service, and exploration will depend on the extent of wilderness designations in the area and on Federal land use policies.

This summary of Montana's basic industries shows that the State's economy is highly vulnerable to national and international markets for its raw materials and agricultural products. Infrastructure needs, too, will fluctuate with whichever phase of the boom-bust cycle the industry may be in. Montana has a history of dependence on boom-bust industries due to its rich natural resource base, and has recently enacted laws to enable it to cope better with these cycles. Resilience and innovation in its institutions and management can further ameliorate some of the physical and economic shortcomings of dependence on natural resource extraction.

¹Montana Energy Almanac, p. 6.

²Montana State Airport System Plan Update, pp. 1-33.

³This paragraph is based on Montana Energy Almanac, p. 109.

Institutional Structure

There are 182 units of local government in Montana: 126 municipalities and 56 counties. As a result of a major public review of local government organization and functions, the Montana Constitution was amended to permit, among other things, city-county consolidations and "home-rule" in both cities and counties. There have been two city-county consolidations (Butte/Silver bow and Anaconda/Deer Lodge), and home-rule was adopted by 15 cities and towns plus Madison County. Capital investments for streets, sewer, and water facilities are often financed through the creation of special improvement districts. There are a large number of such districts, and no compilation of capital investments made under improvement districts was available.

The State of Montana is a biennial budget state. The Legislature convenes once every two years, and the length of each session is limited to 90 days. Annual budgets are prepared and approved by the Legislature, and appropriations may be continued into the next fiscal year when authorized by the Legislature or the Governor.¹ Departments may, with the approval of the Governor, amend appropriations for programs funded from the General Fund within the appropriation limits contained in the annual budget.

Total state revenues for all funds was about \$1.20 billion in fiscal year 1962. Montana's revenues by sources are shown in Table 1.

¹This paragraph is based on State of Montana, Annual Financial Report for the Fiscal Year July 1, 1961 - June 30, 1962, hereafter referred to as Montana Financial Report.

Table 1
Revenues by Source, Fiscal Year 1982
(Millions of Dollars)

Source	Amount	Percent of Total
Taxes	473.9	39.6
Licenses and Permits	40.2	4.0
Charges for Sales	53.7	4.5
Investment earnings	137.0	11.5
Reimbursements	19.5	1.6
Rentals, Leases, Royalties	39.9	3.3
Fiduciary and Trust	55.1	4.6
Federal and Other Grants	273.0	22.9
Miscellaneous	56.9	4.5
Income Collections and Transfer	35.0	3.0
TOTAL	1,195.8	99.9

Source: Montana Financial Report, p. IV.

Table 1 shows that almost 23% of Montana's revenue in fiscal year 1982 was derived from Federal and other grants. Although no conclusions can be drawn about Montana's vulnerability to reduced Federal assistance without a careful examination of the type and sources of grants involved, the State may be much less able to make major capital investments in infrastructure if the Reagan Administration succeeds in shifting additional responsibilities to state governments under its 'New Federalism' program, or if major changes are not made in the State's expenditure/revenue patterns.

Total state expenditures for fiscal year 1982 were approximately \$1.02 billion. Expenditures by function are shown in Table 2.

Table 2
Expenditures by Function, Fiscal Year 1982
(millions of Dollars)

<u>Function</u>	<u>Amount</u>	<u>Percent of Total</u>
Current:		
General Government	66.0	7.9
Public Safety and Corrections	40.9	4.0
Transportation	157.6	15.5
Health and Social Services	216.4	21.5
Education and Cultures	305.5	30.0
Resources Development and Recreation	45.5	4.3
Economic Development and Assistance	94.6	9.3
Sub-Total	976.7	96.3
Capital Outlay	24.6	2.4
Debt Service	15.3	1.3
TOTAL	1,016.6	100.0

Source: Montana Financial Report, p. V.

Capital outlay comprised only 2.4% of state expenditures for fiscal year 1982. Ninety-five percent of this expenditure was for land and buildings.¹ Capital outlay for basic infrastructure are included under other functions listed in Table 2 and are discussed below for each infrastructure category.

¹Montana Financial Report, p. 34.

Montana may incur debts if authorized either by a two-thirds vote by each house of the Legislature or by referendum. There is no constitutional or statutory limit on indebtedness other than a provision that no debt may be incurred to cover deficits created when appropriations exceed anticipated revenues. Outstanding direct state debt as of June 30, 1962 was \$74.22 million. General obligation long-term debt comprised \$62.50 million of the total debt. The remainder of the debt is supported solely by the pledge of specific tax receipts.¹

Additional bonds have been authorized but not issued. In 1961, the Legislature authorized a \$5 million bond issue to provide for loans for local water development projects and \$250 million of bonds for state water development projects, to be secured by a pledge of revenues from the coal severance tax. None of these bonds has been issued. In 1975 the Legislature authorized a \$5 million bond issue for renewable resource development. This issue has not been sold. The State is also authorized to issue industrial development bonds to finance facilities for railroads, air transportation, and water storage. Issuance of these bonds is under consideration.²

The state may also incur short-term debt through the issuance of Tax and Revenue Anticipation Notes. These notes may be issued by the board of Examiners upon recommendation by the Department of Administration. The notes must be redeemed before the end of the fiscal year in which they were issued,

¹This paragraph is based on Montana Financial Report, pp. V, 13.

²This paragraph is based on Montana Financial Report, p. 14.

and total outstanding short-term debt may not exceed \$50 million at any time. No short-term note may be issued to refund outstanding short-term notes. During fiscal year 1967, the Board issued \$45 million of these notes.¹

¹This paragraph is based on Montana Financial Report, p. 22

II. Transportation

Introduction

Montana is a large, sparsely populated state whose export economy is based largely on agriculture and resource extraction. Since most of the goods it produces must be transported to destinations outside of the State, Montana must have an efficient transportation system if its economy is to remain competitive with other resource-based economies.

In October, 1961, Governor Schwinden formed the Transportation Advisory Council to evaluate Montana's major transportation problems and to develop recommendations for submittal to the 1963 Legislature. The Council was composed of business and community leaders and issued its report in September, 1962.¹

The general recommendations of the Council were to promote: the efficient transportation of Montana's most important export commodities, coal and grain; lower cost railroad service; improved efficiency in the trucking industry; improved air and passenger transportation; and an adequate highway system.² The recommendations of the Council relevant to basic infrastructure investment needs will be discussed under the appropriate categories below.

¹The Governor's Transportation Advisory Council, Montana Transportation, September 1962.

²Montana Transportation, p. 11.

Highways

Background

There are 78,152 miles of highways and roads in Montana.¹ Of this total, the State is responsible for the 11,704 miles that are part of the Federal-aid system. The remaining 66,448 miles are the responsibility of local governments.

The Federal-aid system consists of interstate, primary, secondary, and urban components. The Interstate highway system in Montana is part of a national network of highways. There are 1,194 miles of Interstate highways in Montana. Primary highways connect major urban and economic centers and were designed to expedite the movement of goods between market centers. There are 5,469 miles of primary highways in Montana. Secondary highways were originally designed to facilitate the movement of goods from farm to market and now serve as collector highways for commuters as well. There are 4,706 miles of secondary highways in Montana, of which 2,525 miles are paved. Urban highways are collector streets located in urban areas. There are 335 miles of urban highways located in 15 cities and towns. Management of urban highways is primarily a local responsibility.

The State highway (Federal-aid) system is administered by the Department of Highways and the Montana Highway Commission. The Commission is made up of five members appointed by the Governor for four-year terms. Each Commission member represents a highway district. As part of its responsibilities, the Commission approves the designation of the Federal-aid system and awards all

¹This paragraph is based on Montana Department of Highways, Montana Highway Program, November 1982, p. 2.

contracts on the system. The Department is responsible for the design and construction of the Federal-aid system and for the maintenance of those portions of the system that are designated as "interstate" and "primary." The Department also maintains some "secondary" roads of the system under agreements with the county in which these roads are located.¹

Travel on Montana's highways declined in 1973 and 1974 due to fuel shortages, but thereafter grew steadily until a peak was reached in 1976.² Traffic volumes for 1951 and estimates for 1962 are close to the 1976 peak. In the past ten years, travel volumes have increased by a total of 30 percent while the mileage of public highways, roads, and streets increased by only 5 percent. Most of the additional mileage was due to new street construction in residential subdivisions. Table 3 shows mileage and travel volume carried by each component of the Federal-aid system of highways. Table 3 shows that almost 80% of vehicle travel takes place on primary and interstate components highways.

¹Montana Highway Program, pp. 4, 6.

²This paragraph is based on Montana Highway Program, p. 6.

Table 3
Mileage and Travel Volume
on Federal-Aid System

<u>Highway Type</u>	<u>Total Mileage</u>	<u>Millions of Annual Vehicle Miles (1961)</u>	<u>Percent of Total Vehicle Miles</u>
Interstate	1194	1500	29
Primary	5409	2000	50
Secondary	4706	400	8
Urban	335	700	13
Total	11704	5200	100

Source: Montana Highway Program.

Vehicle registration in Montana increased 21 percent between 1972 and 1961. During the same time, Montana's population increased 13 percent. There were a total of 716,177 automobiles and trucks registered in 1961.¹ Trends in travel volume and vehicle registration indicate that Montana's highway system will continue to be used more intensively with each passing year.

Conditions of Existing System

The department of highways uses a "sufficiency rating" to determine the condition of a section of highway. The factors that comprise the rating are: (1) structural adequacy (50 points); (2) safety (20 points); and (3) hourly

¹Montana Highway Program, p. 6.

service volume (30 points). The maximum rating is 100 points. Any section of highway with a sufficiency rating of less than 60 is considered "deficient." Sections with a rating of less than 40 are considered "critically deficient."¹

In 1981, the Department conducted a sufficiency study of the entire Federal-aid system and found that 450 miles of primary highways (8.4%) were critically deficient. In addition, 2,203 miles were rated "deficient" (40.3%) and will need reconstruction or repair within ten years.² The ratings were made through visual inspection tempered by professional judgment. The study established a direct correlation between roadway age and overall condition. About half of Montana's primary highways are 25 years old and a fourth over 40 years old.³ During the past three decades, most of the resources of the Department were devoted to construction of interstate highways, and other highways were neglected. The department plans to correct this neglect by placing priority on primary highways during the next ten years.⁴

Interstate highways in general were built more recently and to higher standards than primary highways. Consequently, they are in much better condition. Federal funds are available for resurfacing, restoration, rehabilitation, and reconstruction ("4R" activities) of interstate highways. Such 4R activities are an integral part of the Department's construction budget.

¹Montana Highway Program, p. 18.

²Montana Highway Program, p. 19.

³Montana Highway Program, p. 16.

⁴Montana Highway Program, p. 27.

The condition of secondary highways is poor. Only about one-half of these highways are paved, and of those that are paved, 1,424 miles are 25 years or older.¹

The Department of Highways does not have a systematic program of preventive maintenance.² However, in future years, the Department will shift emphasis from construction to preventive maintenance.³ The Department's recent expenditures for maintenance and construction relative to total expenditures are shown in Table 4.

Table 4
Montana Highway Program Expenditures
1978-1983
(Millions of Current Dollars)

	<u>Total Expenditures</u>	<u>Construction</u>	<u>Percent of Total</u>	<u>Maintenance</u>	<u>Percent of Total</u>
1978	154.3	100.4	65.1	23.2	15.0
1979	141.4	84.2	59.5	25.4	18.0
1980	200.1	133.0	66.5	30.2	15.2
1981	204.1	133.7	65.5	30.7	15.0
1982	152.4	84.4	55.4	34.4	22.6
1983	185.7	110.1	59.3	38.5	20.7

Source: Montana Highway Program, p. 15.

¹Montana Highway Program, p. 16.

²Montana Transportation, p. 25.

³Montana Highway Program, p. 27.

Table 4 shows that the Department devoted an average of 62 percent of total expenditures to construction and approximately 20 percent to maintenance over the six-year period. For the most recent period, the 1961-1963 biennium, the proportion of total expenditures devoted to maintenance averaged about 20 percent while that devoted to construction averaged about 59 percent. From these data, it is apparent that the Department is beginning to place more emphasis on maintenance and less on construction.

Investment Needs

The Department of Highways has prepared an assessment of Montana's highway investment needs over the next ten years for presentation to the Legislature during the 1963 session. The assessment was prepared in response to the reviews of transportation problems conducted by the Governor's Transportation Advisory Council,¹ by the Joint Subcommittee on Highways of the Legislature, and by the Governor's Council on Management.² The Department's proposal for a 10-year investment program was also prompted by a thorough evaluation of the condition of the Federal-aid system in Montana.³ This evaluation, (discussed above) showed that Montana's highway system was badly in need of repair.

¹Montana Transportation.

²Montana Highway Program, p. 1.

³Montana Department of Highways, 1961 Montana Primary Highways Sufficiency Ratings, December 31, 1961.

The Department prepared a two-tiered investment plan. The first tier is an investment program that will bring the Federal-aid system into conformance with current design standards. The second-tier program is based on a modification of design standards to achieve a "reasonable level of service" on the Federal-aid system of highways.^{1,2}

Full Design Standards

An investment program based on fully meeting current design standards will require \$3.78 billion over the next 10 years. The details of this program are shown in Table 5, and explained below.

Table 5
Investment Needs -- Full Design Standards
1983-1992
(Millions of 1982 Dollars)

	<u>Construction/Reconstruction</u>	<u>Cyclical Pavement Preservation</u>	<u>Total Need</u>	<u>Annual Need</u>
Interstate	154.5	319.6	474.2	47.4
Primary	1435.0	470.9	1905.9	190.6
Secondary	1177.0	---	1177.0	117.7
Urban	223.5	---	223.5	22.4
Total	2990.0	790.6	3780.6	378.1

Source: Montana Highway Program, p. 20.

¹Montana Highway Program, p. 18.

²As will be seen later, the high costs of these two tiers led to the development of even a third (affordable) tier.

Remaining interstate highway gaps will be constructed according to current Federal standards. There are 46 miles of four-lane and 20 miles of two-lane highways that must be built to complete the interstate system in Montana.¹ The Department estimates the cost of completion to be \$134.5 million. Reconstruction and repair will also be performed according to Federal 4R standards. Pavement will be maintained on the interstate system by applying sealcoats every 7 years and by overlaying every 14 years. This maintenance schedule conforms to national engineering standards. The Department estimates that sealcoats will cost \$23,400 per mile and overlaying \$296,700 per mile.²

Primary highways will be reconstructed or improved as necessary so that all roadways have a sufficiency rating of at least 60.³ Those primary highways rated above 60 will be maintained through a cyclical program of sealcoating every 7 years and overlaying every 14 years. The department estimated costs to be \$9,600 per mile for sealcoats and \$95,400 per mile for overlays. Under the cyclical maintenance program, sealcoats and overlays will be applied to about 390 miles of primary highways each year. Primary highways rated between 40 and 60 will receive "S-K" (resurfacing, restoration, rehabilitation) improvements such as overlay and minor widening. Primary highways rated under 40 on the sufficiency scale will be reconstructed immediately and maintained as described above.

¹Montana Highway Program, p. 2.

²Montana Highway Program, p. 10.

³This paragraph and the following two paragraphs are based on Montana Highway Program, pp. 18-20.

All secondary highways will be improved to meet full design standards. Unpaved secondary highways will be paved. Cyclical maintenance will be performed by counties.

Urban highway needs were estimated by the Department on a statewide rather than a section-by-section basis. Inventories on roadway conditions were not available by urban areas. The Department's projected statewide needs are based on the transportation plans of the five urban areas in Montana which have current plans. Maintenance will continue to be the responsibility of local government.

Modified Level of Service

The high cost of the investment program based on meeting full design standards led the Department to study an alternative program to meet a modified service level standard.¹ This standard is based on meeting needs on only the most heavily used segments of the Federal-aid system, rather than bringing the entire system up to design standards. A small fraction of highways in Montana carry a disproportionately large share of traffic. These highways serve large urban areas and carry mostly through-traffic. The most heavily used segments of these highways are classified as principal arterials and those less heavily used as minor arterials.

¹This paragraph and the following six paragraphs are based on Montana Highway Program, p. 21.

Under the modified service level, those principal arterials in poor condition will be reconstructed to meet full design standards. Principal arterials in fair to good condition will be moderately improved so that a cyclical maintenance program will be effective. The investment needs under this standard are shown in Table 6.

Table 6
Investment Needs -- Modified Service Level
1983-1992
(Millions of 1982 Dollars)

<u>System</u>	<u>Construction Reconstruction^a</u>	<u>Cyclical Pavement Preservation^b</u>	<u>Total Need</u>	<u>Annual Need</u>
Interstate	154.5	206.9	361.4	36.1
Primary	702.0	199.2	901.3	90.1
Secondary	193.9	-- --	193.9	19.4
Urban	223.5	-- --	223.5	22.4
Bridges	<u>87.2</u>	<u>-- --</u>	<u>87.2</u>	<u>8.7</u>
TOTAL	1,361.2	406.1	1,767.3	176.7

^aOne-time construction and/or reconstruction costs.

^bPavement preservation is based on a cycle of sealcoats every 10 years and overlays every 20 years.

Federal regulations do not permit flexibility in the design and construction of interstate highways, and investment need for construction

under both programs is the same. Under the modified service level program, the Department would stretch out the sealcoat and overlay intervals from 7 and 14 years to 10 and 20 years, respectively.

For secondary highways, only those sections classified as principal arterials and with a sufficiency rating of less than 40 would be reconstructed to full design standards. All other arterials classified as principal or minor with a sufficiency rating of less than 60 would be considered for minor widening and resurfacing. All sections rated above 60 would be eligible for pavement preservation under the same 10 and 20-year cycles for sealcoat and overlay used for interstate highways.

Secondary highways under the modified service level approach would be upgraded by applying 3R rather than full design standards. Paving would be done only on sections that are already paved and on gravel roads that carry 700 vehicles a day or more. Minor widening of paved and unpaved roads will be done if necessary.

Urban highway needs are assessed through a formal planning process at the local level. The Department did not modify urban highway needs from that based on full design standards defined at the local level.

Revenues

Most of Montana's funds for highway construction are derived from the Federal Highway Trust Fund. Construction matching and maintenance funds are derived from State sources. All maintenance costs are funded by the State of the Highway Earmarked Revenue Account..

Federal funds are apportioned for each of the categories in the Federal-aid system (interstate, primary, secondary, urban) and for program categories (e.g., safety). Specific matching ratios are set for each category in the Federal-aid system as well as for program categories. Table 7 shows the 1982 apportionment of Federal funds for the Federal-aid system, State matching ratios, and eligible expenses.

Table 7
Federal-Aid Apportionment

<u>Category</u>	<u>Federal Apportionment (Millions of Dollars)</u>	<u>Matching Ratio (Federal-State)</u>	<u>Eligible Expenses</u>
Interstate	36.38	91.21: 8.79	construction, resurfacing, restoration, rehabilitation, and reconstruction
Primary	17.47	78.35: 21.65	construction, reconstruction, resurfacing, and rehabilitation
Secondary	7.2	78.35 21.65	construction, resurfacing
Urban	3.8	78.35 21.65	construction, reconstruction
*Total	64.85		

Source: Montana Highway Program, pp. 2, 11.

*This total does not include \$14.2 million apportioned for bridge replacement and "other" expenses.

The amount of Federal funds actually provided to Montana is less than that which is apportioned to it. The Federal government has placed a ceiling on the sum of funds it is obligated to pay for all programs. The Federal "obligation" is less than the sum of funds that has been apportioned to all program categories. The fiscal obligation ceiling, not the apportionment, constitutes the actual amount of funds that the Department of Highways can expend for new projects. Although Montana's total Federal-aid apportionment for all highway categories and programs in FY 1982 was \$79 million, the obligation ceiling was \$66 million. In FY 1983 the expendable apportionment "balance" will be \$52 million.¹ Table 3 shows the total Federal-aid obligation for Montana in recent years.

Table 3
Federal-Aid Obligation

<u>Fiscal Year</u>	<u>Amount (Millions of Dollars)</u>
1976	74.1
1979	155.1
1980	62.7
1981	87.4
1982	66.1

Source: Montana Highway Program, p. 14.

¹Montana Highway Program, p. 11.

Between fiscal year 1981 and 1982, Federal aid dropped by 30 percent. The Department of Highways expects that Federal funding in FY 1983 will remain about \$66 million and will rise to about \$80 million by 1985.¹ In addition, with the recent increase in the Federal tax for motor fuels, Montana expects to receive additional revenues during this period.

State revenues for highway construction and maintenance are generated primarily from fuel tax receipts, income from gross vehicle weight fees, and mineral royalties. These revenues are collected in the Highway Earmarked Revenue Account. In fiscal year 1982, an allocation of \$20 million from the General Fund was required to keep the Account solvent. Revenues for fiscal year 1982 are shown in Table 9.

Table 9
Highway Earmarked Revenue Account
Revenues for Fiscal Year 1982

<u>Revenues</u>	<u>Amount (Millions of Dollars)</u>	<u>Percent of Total</u>
Gasoline Tax	36.8	38.5
Diesel Tax	11.7	12.2
Gross Vehicle Weight Income	20.6	21.6
Mineral Royalties	5.8	6.1
General Fund Allocation	20.0	20.9
Accounts Receivable	0.7	0.7
Total	95.6	100.0

Source: Montana Highway Program, p. 13.

¹Montana Highway Program, p. 14.

Motor fuel tax receipts have generally risen over the past decade but at a declining rate of increase. Receipts rose from \$35.8 million in 1975 to \$50.1 million in 1980, an average yearly increase of 5 percent. However, in 1981 receipts dropped 4% to \$47.9 million, and in 1981 rose by only 1% to \$48.5 million.¹ Gasoline consumption peaked in 1978 and has declined for the past several years. The use of diesel and other "special fuels" such as liquid propane and gasohol has steadily increased from 10% of all motor fuels in 1960 to 19% in 1981.²

Disbursement of funds from the Highway Earmarked Revenue Account is determined according to a budget submitted by the Department of Highways and is approved by the Legislature for each biennium. In fiscal year 1982, disbursements totalled \$76.3 million and are shown in Table 10. About 20.2% of the disbursements were made to agencies other than the Department of Highways.

Table 10
Highway Earmarked Revenue Account
Disbursements for Fiscal Year 1982

<u>Disbursements</u>	<u>Amount (Million of Dollars)</u>	<u>Percent of Total</u>
Highway Program	70.8	79.8
City-County Distribution	6.6	8.6
Highway Patrol	5.0	6.6
Department of Revenue	0.6	0.8
Statewide Building	0.7	0.9
Equipment Bureau Capital	2.5	3.3
Total	83.3	100.0

Source: Montana Highway Program, p. 13.

¹Montana Highway Program, p. 14.

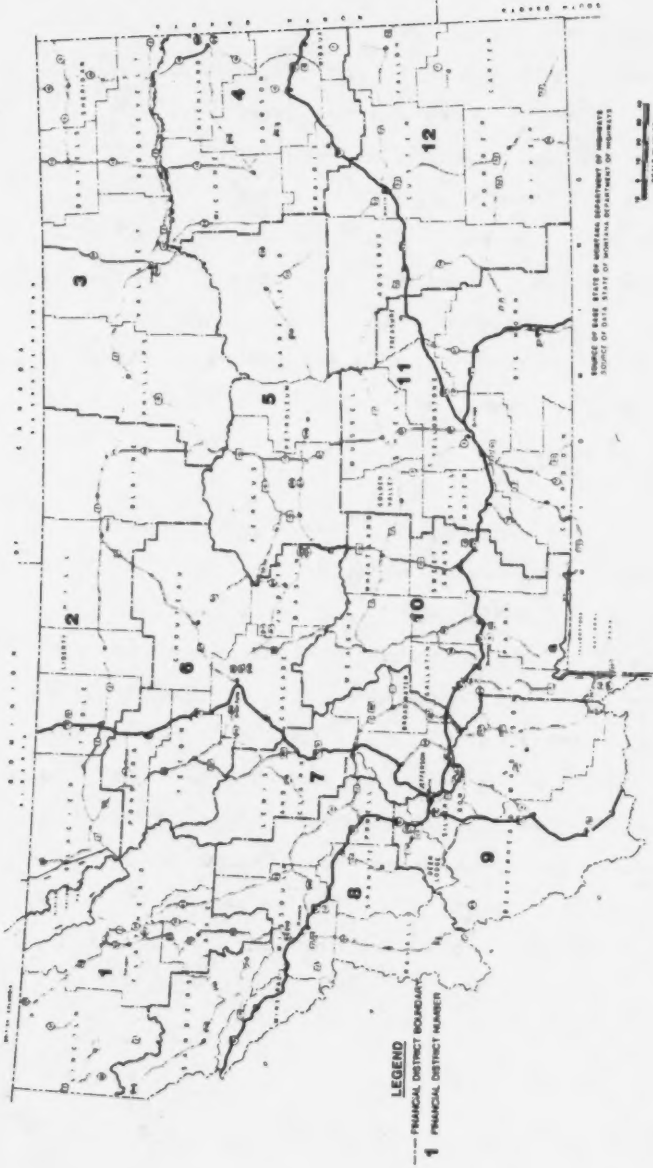
²Montana Highway Program, p. 14.

The flow of revenues is further complicated by Montana Financial District Law which divides the State into twelve districts (see Figure 2) and seeks to distribute highway funds equitably among the districts, counties, and cities.¹ The Laws set forth how distribution ratios and priorities for highway programs are to be determined. For example, interstate construction money is distributed among the districts according to the ratio of the cost of completing the interstate in a given district to the cost of completing it throughout the State. Priority for interstate construction is determined by the Department of Highways. For primary highways, distribution of funds is determined by the ratio of deficient miles of highway in the district to that statewide, and priority is determined by the Department of Highways with the concurrence of the Highway Commission.

The Financial District Law applies only to State-generated revenues, but because these revenues are used to provide matching funds for Federal funds, the Law also controls the distribution of Federal highway funds in Montana. The Law was designed to finance the construction of Montana's highway system on an equitable basis, but it has also adversely affected long-range planning and the setting of construction priorities on a statewide basis. A highway that ranks as first priority in a district but much lower on a statewide basis may receive funding while more critical needs remain unmet. Furthermore, local governments often must accumulate their apportionments over a number of years before they can begin a major project. The Governor's Transportation Advisory Council recommended that a method other than that contained in the

¹This and the following paragraph are based on Montana Transportation, p. 28.

Figure 2



MONTANA HIGHWAY SYSTEM AND FINANCIAL DISTRICTS

Source: Montana Transportation

Financial District Law be devised to determine the distribution of highway funds in Montana.¹

Needs Versus Revenues²

The Department of Highway's assessment of needs was discussed earlier under "full-design" and "modified level of service" criteria. Even the latter, however, would cost \$1.68 billion over the next ten years and would be well beyond Montana's present capacity to finance it. Recently, the Department proposed a 10-year program to address Montana's needs in an affordable way. The program calls for a "substantial infusion" of State funds to reverse the deterioration of Montana's highway system.

Although the Department determined that the largest percentage of unmet needs is on the urban system, it has placed the highest priority on meeting needs on the primary system, for three reasons. First, the primary system contains the main transportation routes for the State as a whole and is the "fundamental responsibility" of the Department. Second, the greatest number of vehicle miles travelled took place on the primary system, and it is vital to the State's economy because of its role in moving goods to and between markets. Third, the primary system has been neglected in recent years while emphasis was being placed on completion of the interstate system.

In addition to the priority placed on the primary system, the program will stress reconstruction and preventive maintenance over new construction.

¹Montana Transportation, p. 20.

²This section is based on Montana Highway Program, pp. 27-30.

The construction schedule for completion of the interstate system will be advanced in order to close most of the gaps in the system as soon as possible. Limitation on gross vehicle weight will be more aggressively enforced to reduce highway pavement damage by heavy vehicles.

In developing its 10-year program, the Department made the following assumptions.

- o apportionments from the Federal Highway Trust Fund will be about \$75 million in FY 1984 and \$80 million in FY 1985 and beyond;
- o apportionment for interstate highway construction through 1990 will be about \$126 million (\$18 million per year).
- o the Legislature will enact substantial increases in State funding for highway programs.

To finance improvements on the primary system, the Department proposed that the Legislature enact a Reconstruction Trust Program at a level of \$40 million per year over the next 10 years. The additional revenues will be derived from increased user fees, by funding the Highway Patrol from the General Fund rather than the Highway Earmarked Revenue Account, and by utilizing funds from coal severance tax revenues. The details of the Department's proposal are shown in Table 11.

Table 11
Reconstruction Trust Program Funding

<u>Source</u>	<u>Amount</u> (Millions of dollars)	<u>Percent of Total</u>
Gasoline Tax--Additional 3¢ per gallon increase	11.7	28.6
Diesel Tax--Additional 4¢ per gallon increase	4.4	10.6
Gross Vehicle Weight Fees-- increase by 35%	4.5	11.1
Funding of Highway Patrol from General Fund	5.0	12.3
Coal Severance Tax Revenues	<u>15.0</u>	<u>36.9</u>
Total	40.6	99.9

Source: Montana Highway Program, p. 28.

Of the \$40 million requested, \$30 million would be used for reconstruction projects, \$8 million for preventive maintenance, and \$2 million for engineering. The department estimated that this additional level of funding will enable it to accommodate about two-thirds of the needs that would otherwise go unmet under even the lowest 10-year program. Funds would be allocated on a statewide basis and not according to the financial district distribution formula.

The Department's proposal to accelerate interstate highway construction beyond that permitted by anticipated Federal apportionments would be financed from the Highway Earmarked Revenue Account and by the sale of \$50 million of bonds. The bonds would be retired over a 5 to 7 year period by using about \$11 million each year of the anticipated annual \$16 million Federal apportionment. Under this accelerated schedule, about 44.2 miles of 4-lane and 5.2 miles of 2-lane gaps on the interstate system could be closed considerably ahead of schedule. The remaining gaps (about 7.5 miles) could be closed using regular interstate construction funds.

To summarize the discussion so far, the Department of Highways has identified two levels of need based on design standards ("full" or "modified") and a third level based on an amount of additional State funding that the department could "reasonably handle."¹ Needs and revenues under these three criteria are shown in Table 12.

Table 12
Needs and Revenues
1985-1992
(millions of 1982 dollars)

	<u>Needs</u>	<u>Revenues</u>	<u>Shortfall</u>	<u>Annual Additional Investment Required</u>
Full-Design Standard	5761	842.2	2929	294
Modified Level of Service	1666	842.2	826	83.8
10-Year Program	1263*	842.2	421	42.1

Source: Montana Highway Program.

*Derived from current expenditure level plus proposed additional financing.

¹Montana Highway Program, p. 20.

The size of the "infrastructure gap" for highways in Montana depends on the criteria upon which need is defined. The Highway Department's 10-year program seems to define a realistic capital investment plan that takes into account funding and administration limitations. The annual additional investment need of \$42.1 million under the program is less than one-seventh of that which would be required under the optimum, or full-design standard, definition of need. If the costs of the 10-year program, excluding interstate highway construction, are extended to the 1993-2000 period, an additional \$324.8 million will be needed.¹

Bridges

There are 2,272 bridges on the Federal-aid system. Of these bridges, 219 qualify for replacement and 943 qualify for rehabilitation under a Federal bridge evaluation program.² According to Federal standards, 1,162 bridges (51%) on the Federal-aid system are structurally deficient.

Under its assessment of needs according to full-design standards, the Department estimated that it will cost \$155 million to replace or rehabilitate all structurally deficient and functionally obsolete bridges.³ Functionally obsolete bridges are those that are structurally sound but no longer adequate to handle present traffic demands. Under an assessment of need based on the modified level of service criterion, the Department proposed to replace only those bridges currently eligible for replacement under Federal standards. The

¹A linear projection was employed, lacking further information.

²Montana Highway Program, p. 16.

³Montana Highway Program, p. 20.

cost of this replacement would be \$67.2 million.¹ The Department did not specify costs for bridge replacement or repair in its 10-year program.

There are 2,136 bridges on roads that are not on the Federal aid system. Of these, 956 qualify for replacement and 666 for rehabilitation according to Federal bridge standards.² No cost estimates were available from the Department. An estimate of cost can be derived from costs for bridge replacement on the Federal-aid system. The Department's estimate that it will cost \$87.2 million to replace 219 bridges implies an average replacement cost of about \$400,000. Bridges on the Federal-aid system carry more traffic than those not on the system and will have a higher average cost. The average bridge area for the 219 bridges eligible for replacement on the Federal-aid system is 4,745 square feet. For bridges not on the Federal-aid system that are eligible for replacement, the average area is about 1,200 square feet.³ If cost is assumed to be proportional to bridge area, the average replacement cost of bridges not on the Federal-aid system is about one-fourth that of those on the system, or about \$100,000. The estimated total cost to replace 956 bridges will thus be approximately \$95.6 million.

The Department estimated that about \$4.6 million will be available annually for bridge replacement.⁴ Under an average bridge replacement cost of \$400,000, about 11 bridges can be replaced each year. It would take 20 years

¹Montana Highway Program, p. 23.

²Department of highways, unpublished report, October 20, 1961.

³Department of highways, unpublished report, October 20, 1961.

⁴Montana highway Program, p. 26.

to replace all 219 bridges on the Federal-aid system that are eligible for replacement under available revenues limitations. If these 219 bridges are to be replaced between 1963 and 2000, there will be a shortfall of about \$9.0 million. Estimates of the cost to repair bridges on the Federal aid system that are eligible for rehabilitation were not available.

Estimates of revenues at the local government level to replace bridges not on the Federal-aid system were also not available. In fiscal year 1962, cities and counties received about \$6.5 million from the Highway Earmarked Revenue Account, or about 10% of that disbursed to the State highway program. If it is assumed that the same proportion of revenues is devoted to bridge replacement at the State and local level, about \$460,000 would be available each year to replace deficient bridges not on the Federal-aid system. At this level of revenue, it would take over 200 years to replace the 950 bridges that are presently eligible for replacement under Federal standards. If these bridges are to be replaced between 1963 and 2000, a shortfall of about \$80 million can be expected.

Needs and revenues for bridge replacement are summarized in Table 13.

Table 13
Needs and Revenues to Replace
Structurally Deficient Bridges
(1983-2000)

	<u>Total Bridges</u>	<u>Bridges Eligible for Replacement</u>	<u>Cost (Millions of 1982 Dollars)</u>	<u>Revenues (Million of 1982 Dollars)</u>	<u>Shortfall (Millions of 1982 Dollars)</u>
Federal-aid System	2272	219	87.2	78.2	9.0
Non Federal- aid System	2136	958	95.8	7.8	<u>88.0</u>
				TOTAL	97.0

Railroad Grade Separations

According to the Department of Highways, 18 railroad grade separations are needed in Montana. The total cost of these separations was estimated to be \$38.5 million.¹ No revenue sources specifically designated for construction of grade separations were identified by the Department.

Summary

The discussion of capital investment needs and revenues for highways, bridges, and grade separations is summarized in Table 14.

¹Montana Department of Highways, letter dated February 15, 1980.

Table 14
Capital Investment Needs and Revenues for
Highways, Bridges, and Grade Separations
1983-2000
(Millions of 1982 Dollars)

	<u>Needs</u>	<u>Revenues</u>	<u>Shortfall</u>
Highways			
Federal-aid System*	3024.0	1516.0	1508.8
Local System**	---	---	---
Bridges			
Federal-aid*** System	87.2	78.2	9.0
Local System***	95.8	7.8	88.0
SUB-TOTAL	183.0	86.0	97.0
Grade Separations	38.5	---	38.5
TOTAL	3246	1602	1644.0

*Amounts from the Department's 10-year program extended to cover the entire 1983-2000 period.

**Not available.

***Includes replacement of deficient bridges only. Rehabilitation needs not counted.

The projected shortfall for 1983-2000 to meet Montana's capital investment needs for highways, bridges, and grade separations is \$1644 million. This estimate is a conservative one as it is based on a minimal definition of need in both highways and bridges. It also excludes the local road system.

Railroads

Background

There are approximately 5,126 miles of operating track in Montana, 20% of which is owned by the Burlington Northern Railroad.¹ Montana's rail system is shown in Figure 3. In 1981, 46 million tons of rail freight originated or terminated in Montana.² Of the originating commodities, coal accounted for 80.3% and was by the far the most dominant commodity shipped by rail in the State. Farm products (7.6%) and lumber (4.3%) ranked second and third, respectively.³

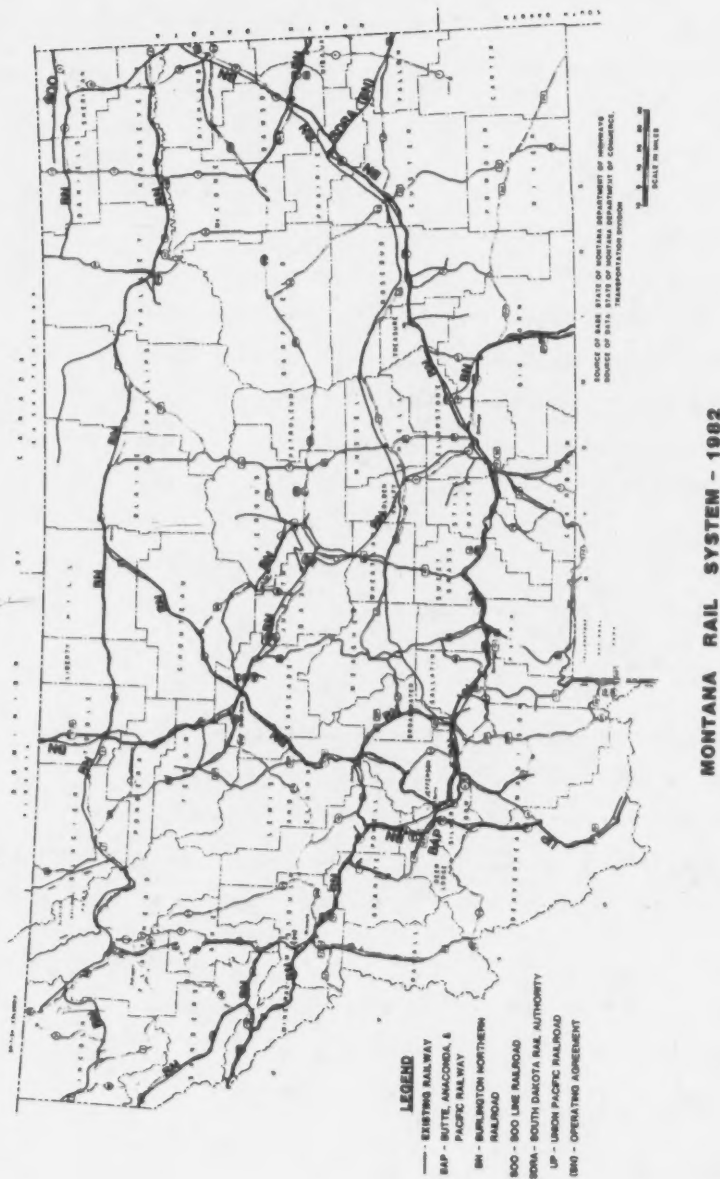
Traffic density varies greatly on the State's rail system with the heaviest traffic occurring on the east-west Burlington-Northern (BN) line that runs through the northern part of the State. Traffic density is also high on the BN line that carries coal from Rosebud County to eastern markets. In addition to the mainline from Glendive to Billings, Great Falls to Shelby is also a well-travelled line. Other segments of Montana's rail system show very low use. Light density lines become unprofitable to operate and may be abandoned by the railroad company subject to approval by the Interstate Commerce Commission. Under recent Federal law, the burden of proof has been shifted to users, who must demonstrate need that the line will be used in an economically viable

¹Montana Department of Commerce, Montana Rail Plan: 1982 Annual Update, September 1982, p. 2-1. Referred to hereafter as Montana Rail Plan.

²Montana Rail Plan, p. 2-10.

³Montana Rail Plan, p. 2-12.

Figure 3



Source: Montana Transportation

way.¹ About 319 miles of line (8.6% of Montana's rail system) are under consideration for abandonment by railroad companies.²

Needs and Revenues

Capital investment needs are predicated on maintaining a rail system that will provide efficient and dependable transportation for Montana's agricultural products. Without such a rail system, it will be more difficult for Montana's farmers to compete with other grain producers in the international grain markets. Branch lines provide farmers the most direct access to rail shipment and are essential for the movement of farm commodities to national and international markets. Abandonment of branch lines will force farmers to ship grain by trucks to grain terminals along main lines. Grain can also be shipped by truck to Lewiston, Idaho, which is the easternmost point on the Snake River from which buyers can ship grain to Portland, Oregon, by barge for access markets in Asia. Rail transportation, however, is less expensive.³

Another important factor that affects Montana's capital investment needs for rail transportation is the unit-train concept introduced by Burlington-northern for grain shipment. The Burlington Northern has determined that grain can be shipped most efficiently from Montana to Portland in 52-car unit trains,⁴ and offers preferential rates for grain shipped in 26-

¹Interview, Department of Commerce Staff, November 1982.

²Montana Rail Plan, pp. 3-5.

³This paragraph and the following paragraphs are based on an interview with Department of Commerce staff, November 1982.

⁴The 52 cars are the maximum number that can be efficiently moved up and down the railroad grades in the Rocky Mountains.

or 52-car allotments. This in turn has created an economic incentive for facilities ("subterminals") that can store and load 52-car loads of wheat. One subterminal can replace many small elevators. Because of the risk of branch-line abandonment, most of these subterminals are located along main lines, thus further reducing rail traffic on branch lines. Many small farming towns with elevators are adversely impacted by the centralization of grain storage and shipment. In 1970, there were over 1500 small grain elevator companies in operation in Montana. By 1980, this number had dropped to 272. Furthermore, increased truck traffic on rural roads to haul grain to the subterminals increases roadway wear and tear.

The Department of Commerce estimates that about \$55 million is needed over the next 20 years to bring Montana's branch line systems into a relatively stable status. The Department has established a revolving fund and a process to determine priorities for branch line rehabilitation. The fund contains \$0.5 million derived solely from Federal grants. The State has not provided any money for the fund. About \$4.5 million has been loaned out. The loans are made to cover 70% or 80% of the project cost with the successful applicant providing the remaining 20-30%.

The accumulation of \$6.2 million in the revolving loan fund began in 1979 when the Department changes its assistance program from grants to loans. The Federal program which has funded rail planning and assistance has dwindled from an \$80 million program nationwide in fiscal year 1981 to \$55 million in

fiscal year 1982. The Reagan administration has recommended no further funding for the program for the next two fiscal years. Montana's allocation in fiscal year 1983 will be about \$750,000.

It is reasonable to assume that Federal funding for the rail assistance program will continue to dwindle and that State funding will not be available. The gap between investment needs and revenues for the period 1983 to 2000 will be in the neighborhood of \$30 million (\$35 million minus the \$6.2 million presently in the revolving loan fund). This gap is a critical one not only for Montana's rail system per se but also for its agricultural sector.

Airports

Background

There are 116 public use airports in Montana. Eight of these airports receive air carrier service by major airlines: Billings, Bozeman, Butte, Great Falls, Helena, Kalispell, Missoula, and West Yellowstone. Seven communities receive commuter air service: Glasgow, Glendive, Havre, Lewistown, Miles City, Sidney, and Wolf Point.¹ Air carrier and commuter service in Montana, as in the rest of the nation, is in a state of flux and uncertainty due to deregulation of the airline industry, the national economy, and the economic conditions of the industry.

The Aeronautics Division in the Department of Commerce is responsible for statewide airport planning. The Division administers the Airport Improvement

¹Montana Aeronautics Division, Montana State Airport System Plan Update, 1982 Technical Report, June 1982, pp. 2-12, 3-4. Hereafter referred to as Montana Airport Plan Update.

Program (AIP) of the Federal Aviation Administration (FAA). It also manages a State program for airport safety improvement and provides technical assistance to local governments. The Division works with a 7-member Aeronautics Board appointed by the Governor. The Board provides policy guidance and recommendations for airport loan or grant applications.¹

Needs

The Aeronautics Division considers Montana's aviation system to be in generally good condition. It inspects all airports annually under a FAA reimbursement program. Maintenance costs are not eligible for AIP funds from the FAA. The Division encourages preventive maintenance and provides technical and financial assistance for this purpose. Maintenance is an eligible item under the State's loan program. Most communities, however, are handling maintenance costs on their own as less than 10% of the loans made by the Division are for this purpose.²

Future needs include additional navigation aids and new airports. Additional navigational aids are needed over the next 20 years at 12 stations. These needs are shown in Table 15.

¹Interview with Aeronautics Division staff, November 1982.

²Interview with Aeronautics Division staff, November 1982.

Table 15
Future Navigational Aids Needed

Station	VOR	Needed Navigational Aids		
		ILS	NDB	UNICOM
Big Timber			X	
Brookus	X			
Chester			X	
Chinook			X	
Colstrip			X	X
Dell			X	
Ekalaka			X	
Glendive	X			
Lincoln			X	X
Sidney	X	X		
Stevensville			X	
White Sulphur Springs			X	X

Source: Montana Airport Plan Update, pp. 4-7 to 4-9.

Needs for the short-term period (up to 1966) include new airports at Colstrip and Wilbax and major improvements at the Kalispell City airport. Also, airports at Ashland, Ekalaka, Ennis, and West Poplar need to be relocated and enlarged. The most critical of these short-term needs is a new airport to serve the Colstrip area where the existing private airstrip built by the owners of the power plant is closed to public use.¹

The Division has also identified "endangered airports." These airports have serious physical problems caused by a lack of preventive maintenance and must be corrected within five years if they are to continue to serve the

¹Montana Airport Plan Update, pp. 4-1, 4-19.

public. These airports are located at Asinland (also identified for relocation and enlargement), Boulder, Benton, Drummond, East Poplar, Jackson, Medicine Lake, Sunburst, Winifred, and Wisdom.¹

For the mid-range period (1967-1991), the Division has identified a need to relocate and enlarge the airports at Bridger, Hardin, and Plains.²

Long-range needs (1962-2001) include new airports at Koenig, St. Ignace, Chico Hot Springs, Fort Peck Shoreline, Cascade, and Grass Range. These airports would improve service for the recreation industry and the agricultural community.³

The Division estimates that approximately \$55 million will be needed over the period 1982 to 2001. Detailed investment needs have been prepared only for the near-term, or 1982-1986 period. These needs are estimated to be \$16,619,000. The investment needs are summarized in Table 10.

¹Montana Airport Plan Update, p. 4-4.

²Montana Airport Plan Update, p. 4-15.

³Montana Airport Plan Update, p. 4-20.

Table 16
Investment Needs for Airports
1982-2000
(Millions of 1982 Dollars)

	<u>1982-1986</u>	<u>1987-1991</u>	<u>1987-2000</u>	<u>Total</u>
Airport Investment Needs	18.619	16.967	20.644(a)	55.23

Sources: Montana Airport Plan Update, p. 4-13
Aeronautics Division staff, unplished report.

(a) Their Plan Update estimated to the year 2001; the study team revised this estimate to fit into the time frame 1982-2000.

Based on these estimates, annual investment needs are \$2.75 million or about \$23,500 per airport per year.

Revenues

Revenues for airport investment needs are derived from Federal, state, and local sources. Revenues from Federal sources are provided through the Airport Development Assistance Program (ADAP). These revenues are derived from a trust fund funded by taxes on aviation fuel and passenger tickets. Montana's allocations in recent fiscal years are shown in Table 17. Allocations are made directly to commercial service airports based on the number of enplanements and to the state for airport planning and development of non-commercial airports.

Table 17

ADAP Allocations for Montana
Fiscal Year 1981-1983

	<u>1981*</u>	<u>1982**</u>	<u>1983**</u>
ADAP Allocation	3,325,966	3,303,976	4,336,537

*Source: Montana Airport Plan Update, p. 4-15.

**Source: Aeronautics Division staff.

State revenues are based on income from a one-cent per gallon tax on aviation fuel. This income pays for all of the administrative costs of the Aeronautics Division and a 50-50 cost-sharing program to provide safety equipment at local airports.¹ Income for recent fiscal years are shown in Table 18.

Table 18

Aeronautics Aviation Fuel Tax Income
Fiscal Years 1978-1982

	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
Annual Income	\$340,664	\$356,202	\$364,216	\$366,769	\$328,126

Source: Aeronautics Division, unpublished report.

¹Interview, Aeronautics Division staff, November 1982.

The average annual income over the past five fiscal years is approximately \$500,000.

The State also provides loans up to \$40,000 for airport improvements. These loans are repayable over a 10-year period at 5% interest. The Legislature appropriated \$200,000 in fiscal year 1983 for the loan program. Many of the loans made under this program are used for construction of airport facilities such as hangars and fuel storage tanks.¹

Local revenues are based on income from property tax and airport operations. State law allows a permissive 2-mill levy by cities and counties which provides the primary source of income for most smaller airports.² Most of the income is used to pay for annual operation and maintenance costs, leaving little for capital improvements or for matching AWW grants.³ Municipalities may incur a debt up to \$150,000 without approval of the electorate under a law passed by the Legislature in 1981.⁴

¹Montana Airport Plan Update, p. 4-10.

²Interview, Aeronautics Division staff, November 1982.

³Montana Airport Plan Update, p. 4-17.

⁴Montana Airport Plan Update, p. 4-10.

Needs versus Revenues

The Division's projection of funding requirements for the 1982-1986 is shown in Table 19. This projection anticipates a shortage of funds for general aviation airports and a surplus for air carrier airports.

Table 19
Needs and Revenues for Airports
1982-1986
(millions of 1982 Dollars)

	<u>General Aviation Airports</u>	<u>Air Carrier Airports</u>	<u>Total</u>
<u>Needs</u>			
Total Costs	10.34	8.26	18.62
ADAP Eligible	10.14	7.73	17.87
ALAP Share (90%)	9.13	6.96	16.09
Local Matching (10%)	1.01	0.77	1.78
Local Non-ADAP	0.20	0.54	0.74
Total Local	1.21	1.31	2.53
<u>Revenues</u>			
Annual ADAP			
Funding Required	1.83	1.39	3.22
ADAP Funds Expected	0.70	2.63	3.33
(Shortage) or Surplus	(1.13)	1.24	0.11

Source: Montana Airport Plan Update, p. 4-13.

The Division projects an annual shortage of about \$1.13 million for general aviation airports and an annual surplus of about \$1.24 million for air carrier airports over the 1982-1986 period. The shortage and surplus projections are based primarily on the expectations that the ADAP funds

received in 1982 (\$3.3 million) will continue at the same level over the entire 5-year period. ADAP funds are allocated to airport categories, and "excess" funds in one category cannot be diverted to meet shortages in another category.

If the level of income received in 1982 is assumed to remain constant for the period 1987-2001, a projection of total revenues versus needs can be made. This projection is shown in Table 20.

Table 20
Needs and Revenues for Airports
1987-2000
(Millions of 1982 dollars)

<u>Needs</u>	<u>1987-1991</u>	<u>1992-2000(a)</u>	<u>Total</u>
Total Project Costs	16.97	19.03	36.00
ADAP Eligible	16.45	18.99	35.44
ADAP Share (90%)	14.80	17.09	31.89
Local Matching (10%)	1.64	1.89	3.53
Local Non-ADAP	0.52	2.15	2.67
Total Local	2.16	4.04	6.20
<u>Revenues</u>			
Expected ADAP Total	16.5	33.0	49.5
(Shortage) or Surplus			
All Projects	(0.47)	11.86	11.39
ADAP Eligible Projects	0.05	14.01	14.06

Source: Aeronautic Division, unpublished report.

(a) Same rate as in Table 19.

The dilemma confronting aviation planners in Montana is that there appears to be more than sufficient funds from expected ADAP allocations to meet ADAP eligible costs. The Division projected investment needs for the 1982-2001 period at \$56.73 million (Table 16) while expected ADAP allocations for the same period are \$66 million (\$3.3 million annually). There is a strong possibility that ADAP funding may be lower in the future because of the large Federal deficits that are expected. Possible changes in program structure, such as a block grant program for general aviation airports and defederalization of primary air carrier airports, will also affect the level and allocation of Federal funding.

The projected surplus hides the fact that revenues for general aviation airports will fall short of needs and smaller airport authorities will find it very difficult to meet the 10% matching required to obtain ADAP funds. Local funds need to meet matching requirements and non-ADAP costs over the 1982-2001 period are projected at about \$8.7 million (Tables 19 and 20). The major source of capital improvement funds for smaller communities is the State loan program that is presently funded at \$250,000 annually. If this program is funded at this level over the 1982-2001 period, \$5.0 million would be available to meet local needs. A shortage of approximately \$3.7 million would result.

The Governor's Council on Management has proposed to the Legislature that the tax on aviation fuel be raised from one-cent to two-cents per gallon.¹ This increase in tax should raise about \$350,000 each year and would provide

¹Interview with Aeronautics Division Staff, November 1962.

about \$7 million over a 20-year period. This level of revenue would be sufficient to meet local needs. The Governor's Transportation Advisory Council has recommended that the permissive mill levy for airports be raised from 2 mills to 4 mills and that \$2.5 million of oil severance tax revenues be appropriated each year for airport maintenance, repair, and reconstruction on a 75-25 cost sharing basis with local governments.¹

Capital investment planning and budgeting for airport facilities are further complicated by deregulation of airlines by the Federal government. Although deregulation has generally improved air service in Montana, smaller airports that have made improvements to facilitate air service provided under Federal regulations may lose this service as deregulation of airlines is completed.² There are seven communities now receiving commuter air service under a program subsidized by the Federal government. The subsidies are scheduled to end in 1988, and the Division fears that continued scheduled air service on a self sustaining basis is in serious jeopardy for most of these communities.³

Public Surface Transportation:

Background

There are ten intercity transit lines in Montana. Rail passenger service is provided by Amtrak to 21 communities seven days per week along a east-west route that parallels U.S. Highway 2 in northern Montana. Nine bus companies,

¹Montana Transportation, p. 12.

²Interview with Aeronautic Division staff, November 1982.

³Interview with Aeronautic Division staff, November 1982.

including Greyhound and Continental Trailways, provide public transportation to 230 communities in 50 counties.¹

There are publicly-owned bus systems in several communities: Billings, Great Falls, Butte, Helena, Missoula, Glasgow (Valley County), Poplar (FortPeck Indian Reservation), Black Feet Indian Reservation (McCane County & Daniels County), Jordan (Garfield County), and Broadus (Powder River County). Annual ridership ranges from 706,000 passengers in Billings to 1,200 in Broadus.²

Public surface transportation is also provided by taxicab companies. In 1980, there were 24 taxicab companies in operation, and the number decreases each year. Many communities also provide specialized transportation for the handicapped and elderly.³

The Division of Transportation in the Department of Commerce is responsible for statewide planning for public surface transportation. The Division provides technical assistance to communities and coordinates public and private sector transit planning.

¹Montana Department of Community Affairs, Transportation in Montana November 1980 (The Department of Community Affairs was abolished in July 1982, and its responsibilities for transit planning were transferred to the Department of Commerce); Montana Transportation, p. 31.

²Transportation in Montana, pp. 7-8.

³Transportation in Montana, p. 7.

Needs and Revenues

Capital investment needs for public surface transportation in Montana are not large. Most of the State is rural and sparsely populated. The major needs are additional buses and bus maintenance facilities.¹ No cost estimates for these needs were available, but they would be negligible compared to highway and airport needs discussed previously.

Revenues for capital investment are derived previously from Urban Mass Transit Administration (UMTA) grants. These grants are available on an 80-20 or 75-25 matching basis for capital improvements and on 50-50 basis for operating expenses. The State also subsidizes operations of public transportation systems under an annual allocation of \$150,000 from the motor vehicle fuel tax. This allocation is an upper limit fixed by State law.

While investment needs for public surface transportation are relatively minor, available or anticipated Federal and State revenues will produce a shortfall. Additional revenues to offset increasing operation cost as well as capital investment funds will have to be met by local tax dollars.

Summary of Transportation Needs and Revenues

The capital investment needs and revenues for transportation are summarized in Table 21.

¹Interview, Division of Transportation staff, November 1982.

Table 21
 Transportation Needs and Revenues
 1983-2000
 (Millions of 1982 Dollars)

	<u>Needs</u>	<u>Revenues</u>	<u>Needs Minus Revenues</u>
Highways	3029	1516	(1508)
Bridges	183	86	(97)
Grade Separations	39	---	(39)
Airports	57	66	(9*)
Public Surface Transportation	---	---	---
Total	3303	1668	(1635)

*Surplus projected for ADAP eligible needs.

Considering all of the qualifications mentioned throughout, a shortfall of \$871 million is projected for capital investment in transportation. This is a conservative estimate. It does not include a projected shortfall for general aviation needs and the small amount of capital investment needed for buses and bus shelters. It also does not include a local highway system component.

III. Water Supply

Background

The Department of Natural Resources and Conservation is responsible for water resources planning, development, and conservation. Water is relatively plentiful in Montana, and there are no shortages of supply for present municipal or industrial needs.¹ However, agriculture consumes about 96% of the water used in Montana and irrigators in areas such as the Big Hole River and Milk River have experienced water shortages.² According to a Water Resources Division staff member, the people of Montana are beginning to realize that a water shortage is possible.³

The State owns 25 water storage facilities with a combined capacity of almost 142,000 acre-feet. All of these facilities are rock or earth-filled structures. Most of the water stored is used for irrigated agriculture. Montana law requires that the Department investigate the feasibility of developing hydropower at all state-owned water storage sites. The Department is pursuing hydropower development at eight of these sites.⁴

There have not been any large Federal water storage projects in recent years. The most recent large project was the Yellowtail Dam which was completed in the mid-1960s. The dam has an annual yield of 400,000 acre-feet. No large, new storage projects are under consideration.⁵

¹Interview, Water Resources Division staff, November 1982. Hereafter referred to in this section as interview.

²Department of Natural Resources, Water Development Program, January 1983, pp. 4-5.

³Interview.

⁴Water Development Program, p. 6.

⁵Interview.

The State also owns an in-stream reservation of 5 million acre-feet of water in the Yellowstone River. The Department of Fish, Wildlife, and Parks plans to apply for an in-stream reservation on the Clark Fork.¹

Needs

The primary need for state-owned water storage facilities is structural repair. The Department has a long-term rehabilitation program to complement its dam safety inspections. The status of the program is summarized in Table 22. Of the 10 dams needing repair, rehabilitation costs have been estimated for only 2. The remainder are being studied to determine costs.

The Department is also studying the effects of downstream water demands upon water rights and development in Montana. The State has entered into interstate compacts with Wyoming for water use on the Yellowstone and Poplar rivers.

¹Interview.

Table 22
Rehabilitation Needs for
State-Owned Water Storage Dams

<u>Dam</u>	<u>County</u>	<u>Status</u>	<u>Cost</u>
Tongue River	Big Horn	rehabilitation under study	\$895,000 feasibility study underway
Bare	Meagher	spillway unsafe	\$ 5,000
Cottonwood	Park	spillway unsafe	under study
Martinsdale	Wheatland/Meagher	spillway needs repair high seepage	under study
Middle Creek	Gallatin	spillway unsafe	under study
Nevada Creek	Powell	spillway inadequate	need funding for study
Smith River (North Fork)	Meagher	operating gate needed	\$15,000
Petrolia	Petroleum	spillway unsafe	under study
Yellow Water	Petroleum	outlet conduit corroded	under study

Source: Water Development Program, pp. 8-11.

Prior to early 1983 there was no compilation available of water system needs for local governments. In November, 1982, a group of State and Federal agencies which finance community water and/or sewer systems formed the "Water and Sewer Agencies Coordinating Team" (WASACT) in order to identify water/sewer infrastructure problems and examine ways of solving these problems.¹

¹WASACT included not only financing agencies but also representatives from local governments as well as other officials with interests in local water system planning and development.

WASACT commissioned a study (The Joint Committee Water Systems Survey) to determine local government water system needs. In the Survey each respondent was asked to list (in order of priority) the top five capital improvements needed, the type of improvement (supply, treatment, distribution, storage), and the estimated cost.

Based on 94 responses¹ the results shown in Table 23 were obtained. The total cost of the 264 projects reported was estimated to be \$85.9 million.

Table 23
Results of WASACT Survey of
Local Government Water System Needs

<u>Type of Need</u>	<u>Numbers of Projects</u>	<u>Estimated Cost</u> (\$ Millions)
Distribution	134	34.6
Supply	55	16.9
Treatment	45	19.2
Storage	<u>30</u>	<u>15.0</u>
TOTAL	264	85.9

These results are consistent with the observation that municipal water system facilities are generally in poor condition, and are illustrative of the magnitude of the problem.² however, since the Survey did not collect data on

¹All nine first-class cities (cities above 10,000 in population) responded, representing 40 percent of Montana's population. The remaining 85 responses were from cities with populations less than 10,000.

²Interview with Water Resources Division staff.

revenues projected to be available to meet these needs, and since the reported needs represent only a portion of the total needs expected over the next 20-year period, it is not possible to include these results in our tabulations. Research and analysis by WASACT is ongoing; further results of these efforts will be available soon.

Revenues

In 1981, the Legislature enacted the Water Development Program to provide State funding for water projects. The source of the funding is an earmarked percentage (0.625%) of gross coal-severance tax revenues. This percentage provides about \$1.5 million each biennium.¹ Future levels of funding will depend on coal severance tax receipts. In 1982, these receipts declined about 12% from those of the previous years.² The program is administered by the Water Resources Division of the Department of Natural Resources and Conservation.

The Department is also authorized to issue up to \$5 million in general obligation bonds to provide loans for water development. In addition, the Department has the authority to issue up to \$250 million in revenue bonds. The Legislature must approve the issuance of bonds on a case-by-case basis and can use coal severance tax revenues to redeem the bonds.³

¹Water Development Program, p. 13.

²Interview.

³Interview.

Projects funded by either grants or loans under the program must be water-related and may be used for construction or for feasibility studies. Eligible activities include development of hydropower facilities; construction or rehabilitation of irrigation facilities; construction of reservoirs and dams; control of saline seep; development of water-based recreational facilities; streambank stabilization and erosion control; development of water supply, water treatment, or rural water systems; and development of conservation measures.¹

The amount of any loan is limited to the smallest of \$100,000, 1% of the funds available for loans, or 80% of the fair market value of the security given for the loan. Grants made to private parties are limited to 25% of project cost or 5% of the funds available for loans. Grants to public entities are not limited unless the project demonstrates a repayment capacity, in which case the grant cannot exceed 25% of the project cost.²

The Department evaluates applications from public entities and makes recommendations to the Legislature which must approve each grant or loan. Grants and loans are made to private entities by the direction of the Department from block funds appropriated by the Legislature. The statutes provide the Department with established criteria upon which to base its evaluations.³

¹Water Development Program, p. 13.

²Water Development Program, p. 13.

³See Water Development Program, pp. 14-15.

Needs and Revenues

For the 1982-1983 biennium, the Department received 150 applications requesting a total of \$27 million of Water Development Program funds. Of these, 83 were considered for funding, evaluated, and submitted to the Legislature. The Department has \$350,000 in funds to loan to private individuals during the 1982-1983 biennium. Twenty-six of the 83 applicants are towns and cities.¹

The likely gap between needs and revenues can be initially surmised by the difference between funding requests (\$27 million) and available funds (\$1.5 million) for the Water Development Program during the 1982-1983 biennium. This gap is about \$25 million. If the revenue remains constant (\$1.5 million per biennium), it will take about 34 years to fund the requests made for the 1982-1983 biennium funding cycle. The requests, of course, included many water-related projects that were not related to water supply or storage facilities. Without a comprehensive needs survey, it is not possible to project the gap between these needs and the funding that will be available through the Water Development Program.

The Water Development Program is one of only two sources of State funding for water supply². The other source is the Community Development Block Grant (CDBG) program. For this source, too, demands for funding exceed available funds. For fiscal year 1982, the program received 48 applications requesting a total of \$13.28 million. The amount available is \$3.47 million. Of the

¹Water Development Program, pp. 2, 28.

²Interview.

requests, 50 were for "public facilities" in the amount of \$9.6 million.¹ The projects included under the public facilities category included water, sewer, and other facilities.

¹Memorandum, Department of Commerce, September 7, 1962.

IV. Drinking Water¹

Background

Drinking water standards are enforced through the Federal Safe Drinking Water Act by the Montana Department of Health and Environmental Sciences. 75% of Montana's program is funded by the Federal government. Montana's safe drinking water program is regulatory in nature.

Needs and Revenues

The Department has found that 26 public drinking water systems in the State need to install filtration facilities for surface waters. About 18 to 20 systems presently exceed standards for one or more chemical contaminants. The Department is now surveying drinking water systems for radiological contaminants.

The Department's program is funded by approximately \$315,000 in Federal grants and by \$105,000 of state monies.

There are no estimates available on the long-term needs for drinking water facilities. The Department's responsibility is to protect the public health. To do this, it must inspect about 2,000 public water systems (1400 non-community systems and 600 community water systems) in the State. Needs are identified during these inspections, but the Department only has authority to require health-related improvements.

¹This section is based on an interview with Department of Health and Environmental Science staff, November 1982.

V. Wastewater Treatment¹

Background

The Water Quality Bureau of the Department of Health and Environmental Sciences is responsible for issuing discharge permits to all wastewater treatment facilities in Montana, except for unincorporated facilities on Indian Reservations. The Bureau also monitors compliance of these facilities with discharge standards and other terms of the permit.

The Bureau provides technical assistance to communities by reviewing plans and specifications for wastewater treatment facilities. It administers the U.S. Environmental Protection Agency's (EPA) construction grants program for wastewater collection and treatment facilities. The EPA completely delegated the administration of the program to the Bureau. The Bureau believes that it is ahead of all other states in the region, except for Utah, in having complete administrative control of the construction grants program.

Needs

According to staff of the Bureau, existing wastewater treatment facilities in Montana are generally adequate. Some of the smaller systems need additional equipment while some of the larger systems need to be upgraded. For the most part, waste water treatment systems are either in good condition or targeted to receive funds in the next few years.

The Bureau estimates that the cost of meeting backlog needs as well as those needs anticipated to the year 2000 will be about \$114.7 million. The

¹This section is based on an interview with Water Quality Bureau staff, November 1982.

Bureau inventoried the needs of 203 communities. Its projection of future needs is based on population projections prepared by the Department of Commerce. Over the period 1983 to 2000, an annual investment of about \$6.37 million is needed.

Revenues

The Bureau has received \$17 million under the EPA construction grants program for fiscal year 1983 (including some fiscal year 82 carryover funds not appropriated until July 1982). For each of the next two fiscal years, the Bureau has been authorized \$12 million. On October 1, 1984, the Federal matching rate will be reduced from 75% to 55%. Congress has authorized the construction grants program to FY 1985. Funding beyond 1985 is uncertain.

Loans and grants for waste water treatment facilities are also available from the Farmers Home Administration (FmHA). The FmHA has traditionally assisted small towns and rural areas through low-interest loans. After 1982, however, the interest rate on FmHA loans was changed from a standard 5% to the current municipal bond interest rate.¹ Higher interest rates and the changes in median income data have discouraged communities from using FmHA loans. Funding for this program has been also been reduced by Congress.

Other programs fund waste water treatment systems. Communities may apply for grants to the CDBG program and for grants and loans to the Coal Board and the Water Development Program of the Department of Natural Resources and

¹Peggy Cuciti, unpublished paper.

Conservation. These grants (and loans) are made on a case-by-case basis for a wide variety of projects.

Needs versus Revenues

On the surface, it appears that Montana can meet its needs for capital investment in wastewater treatment systems, if existing funding programs are continued at the same level. For example, the Bureau's estimate of \$114.7 million that will be needed to meet needs up to the year 2000 could be met at half of the current annual EPA funding level of \$12 million.¹ Yet annualizing expenditures and revenues suggests the ability to postpone strategic needs and project stable Federal assistance programs. Both assumptions are dubious. Additionally, future funding (beyond 1985) of the varied construction grants program is uncertain. Montana may well have to increase use of its own resources.

VI. Solid and Hazardous Waste Disposal¹

Background

The Solid Waste Bureau of the Department of Health and Environmental Sciences conducted a study two years ago on local government expenditures for solid waste collection and disposal. It found that most smaller towns did not maintain adequate records on costs and revenues. For example, collection costs were not separated from disposal costs or from other costs. The Bureau also found very little planning at the local level for future solid waste disposal needs.

Almost all of the 230 public disposal facilities in Montana use landfill. There is one resource recovery plant in operation (at Livingston). Waste heat from the operation is sold to the Burlington Northern railroad. Many of the larger cities are beginning to use area-wide central disposal facilities. The Bureau exercises State authority to issue and enforce solid waste disposal siting criteria as well as operation and maintenance standards for such sites. It has no regulatory authority over collection, although it has tried to promote area-wide management of solid waste collection and disposal.

Hazardous waste disposal is under the jurisdiction of the Department. A permit is required for treatment, storage, and disposal facilities. No permit is required to generate the wastes in the first place. However manifests are required for transport of the hazardous wastes from one place to another. An application for a hazardous waste disposal site permit must include, among

¹This section is based on an interview with a staff member of the Solid Waste Bureau of the Department of Health and Environmental Sciences, November 1982.

other things, plans and costs for closure and for a 30 year post-closure period. For larger companies, funds must be placed in escrow to cover these costs. Smaller companies can post a bond to meet this requirement. The Bureau expects to have full administrative authority over hazardous waste disposal regulations by 1985.

There are no commercial hazardous waste disposal facilities in Montana. All hazardous wastes are either stored where they have been generated or are shipped to disposal facilities located out of state.

Needs

In its survey, the Bureau found the most pressing need at the local level to be professional management of solid waste disposal facilities. The Bureau feels that the lack of technical expertise and budget management in smaller communities is a serious problem. This lack of professional management became evident when the Bureau attempted to compile statewide costs for solid waste disposal needs and found it could not do so from the records maintained by most communities.

The Bureau projects that landfill capacity for solid waste disposal will be more critical for solid wastes than for hazardous wastes. The siting of landfills is a politically controversial issue in Montana as it is in other states. The price of private property for landfill sites is rising very rapidly and putting more demand on the use of public lands for such sites. The U.S. Forest Service and the Bureau of Land Management are also becoming

more restrictive in allowing public lands to be used for solid waste disposal sites. The Department of State Lands has provided land for disposal sites in the past, but it, too, is more reluctant to do so because of possible liabilities and expenses for remedial clean-up.

County Commissioners have the authority to condemn land for solid waste disposal sites. However, this authority has never been used. According to the Bureau, it would be "politically suicidal" for Commissioners to invoke that authority. There has also been an increase of lawsuits filed by private citizens against local governments over solid waste disposal issues.

Given these obstacles to new solid waste disposal sites, the Bureau foresees a serious shortfall of disposal capacity within five to ten years. The Bureau estimates that it will cost from \$3 to \$5 per household per month to develop and maintain proper landfill facilities, exclusive of land acquisition costs. This cost estimate translates to \$36 to \$60 per household per year. For the year 2000 population projections of 955,600 and an average household of 3 persons, the Bureau's annual cost estimate would be between \$11.2 and \$18.7 million. For the same average household size, the annual cost to serve the 1990 projected population of 859,000 would be between \$10.3 and \$17.2 million.

The Bureau does not anticipate a need for a commercial hazardous waste disposal site in Montana during the next ten years. Needs beyond ten years are very uncertain. The Bureau does see a need for better environmental

monitoring, contingency planning, and emergency training for workers with regard to hazardous wastes. The cost of these needs is uncertain.

The Bureau is monitoring ground water. Data from this monitoring may reveal a need for a central commercial disposal facility for hazardous wastes. The EPA is now conducting a 3-year study to determine what particular hazardous wastes should be regulated. The results of this study could drastically affect hazardous waste disposal in Montana. The Bureau assumes that most capital investments for hazardous waste disposal will come from private sources.

Revenues

Almost all communities derive revenues from user fees. The Bureau, however, was not able to compile revenue data because of poor record-keeping at the local level.

Funding is available from coal severance tax revenues for communities impacted by coal mining activities. In 1981, the Coal Board provided \$350,000 in grants for solid waste disposal. These grants included \$200,000 to Livingston and \$150,000 to Billings and Yellowstone County for analysis of resource recovery facilities. These grants are made on a project-by-project basis each year.

Federal funding is available through the EPA. The Bureau received a \$201,000 grant for hazardous waste management in fiscal year 1982. Future funding is uncertain.

Needs Versus Revenues

It was not possible to estimate the difference between needs and revenues for hazardous wastes due to lack of data at the local level and the uncertainty of revenues. The Bureau's estimate of need based on an average per capita expense was about \$325 million for the 1983-2000 period. Revenues from Federal and State sources have been about one-half million dollars per year. This annual revenue level would amount to \$9 million over the years 1983-2000, and would mean a shortfall of about \$316 million for the same period. This is a conservative estimate since land acquisition costs are not included.

VII. Summary

This case study attempted to bring together the best available estimates for Montana's public investment needs and revenues for basic infrastructure. The study deals primarily with basic infrastructure needs and responsibilities at the state level.

The estimates of needs and revenues discussed in previous sections are summarized in Table 24.

Table 24
Summary of Needs and Revenues
1983-2000
(Millions of 1982 Dollars)

	<u>Needs</u>	<u>Revenues</u>	<u>Shortfall</u>
Highways(a)	3024.0	1516.0	745.0
Bridges	183.0	86.0	97.0
Grade Separations	38.5	--	38.5
Railroads	35.0	6.2	28.8
Airports	55.2	66.0	(10.8)(b)
Public Surface			
Transportation	--	--	--
Water Supply(c)	86.0	13.5(d)	13.5
Waste Water Treatment	115.0	115.0	0
Solid and Hazardous Waste			
Disposal	325.0	9.0	316.0
Total	3861.7	1811.7	2,050.0

(a) Federal-aid system only.

(b) Surplus projected for ADAP eligible needs only.

(c) No need and revenue estimates were available for drinking water treatment.

(d) Coal severance tax revenues only -- does not include State bonding authority.

This estimate of Montana's capital investment needs and revenues for basic infrastructure was based on a compilation of existing information and interviews with state officials in Helena. The estimate does not include needs and revenues for local streets and roads or for drinking water treatment and distribution. Information to make an estimate for these needs and revenues were not available.

